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The country is wild, picturesque, and densely wooded. The men are fine-looking. Blue eyes are rare, but brown ones, and light, or even reddish hair, are common. The complexion varies from a ruddy blond to a bronze color, which is, doubtless, partly due to exposure. Their stature is but moderate. The men are fearless but lazy, and leave the work of agriculture to the women. When not at war they hunt. They are devoted to the dance, with which they occupy most of their evenings. The dance in use is invariably initiated by a woman, who goes through a prelude of graceful posturing. At a given signal, the dancers take their places on either side of the fire; the musicians, with a drum, flutes, and cymbals, taking a place at the end of the lines. At a second signal, couples form, and later turn singly around the fire. The dance terminates by a new formation of couples, holding a stick between them, feet firmly planted and close together, when they turn with great rapidity, first from right to left, and then in the reverse direction.

The houses are constructed on the mountain-side. The ground-floor is of stone, ten or twelve feet high, and is not used, except for storing wood and dry dung, both used for fuel, the latter especially in the preparation of cheese, which is made daily, and is of good quality. Above the stone foundation the structure is entirely of wood, with a sort of gallery around it. There are but two rooms, clean but very dark. The door-jambs are rudely carved. There is little furniture, but chairs of wood or wicker are in general use. The ordinary food is composed of bread and cheese in a sort of sandwich, dipped in melted butter, and boiled meat. The beds are built like a bunk attached to the wall. Some houses are provided with two stories, both of similar construction. The roof is made of flat stones, covered with a coating of clay.

The temples comprise a single square room, in which there are some large water-worn stones taken from the bed of the river, but no idols, except certain figures used in the funeral ceremonies be so considered. The dead are taken in their coffins into the temple, where sacrifices are made, and the remains then carried to the appointed place in the cemetery, but they are not buried. As to religion, the Kafiri believe in a passive supreme being, and a very active devil to whom all mischances are ascribed.

The men shave the head, except a single long lock on the summit, and go uncovered. Their dress is much like that of the Afghans, chiefly of cotton, with leather buskins made of laced strips of hide. The women wear the hair long, coiled under a large bonnet, through the top of which two tufts of hair project, looking at a distance like horns. Slavery is practised. Polygamy is exceptional. The unfaithful wife is beaten, and her lover fined not less than six head of cattle, and more according to his means. They have been supposed to be great wine-bibbers; but Mr. Macnair found in use only grape-juice, neither fermented nor distilled. This is pressed out during the vintage, and kept in jars under ground until needed. They are armed with the bow and

arrow and a few matchlocks. The traveller observed artificial ponds, made to entice the wild ducks who pass over in their annual migrations. Some of the rivers carry gold; but the chiefs oppose washing for it, having in view the inevitable consequences to which successful gold-mining would give rise.

The people are intensely jealous of European invasion. The mere suspicion of European origin several times put the life of Mr. Macnair in serious danger, and intended journeying in several directions was given up as unsafe on this account.

### THE CHANGES WHICH FERMENTATION PRODUCES IN MILK.<sup>1</sup>

MILK, if left standing a short time, becomes a sort of acidulated jelly called curd. In cheese-making this transformation is hastened by bruising; but in both cases the acidity and the peculiar savor of the curdled milk are caused by a microbe, the lactic bacillus, whose little rods are swimming by millions in the turning liquid. Only the caseine, the albuminous portion of milk, which forms the principal ingredient of cheese, coagulates: the lactic bacillus, recently studied by Mr. Hueppe, avoids this, and prefers the sugar of the milk, which it changes into a lactic acid. Without the bacillus, the milk would not sour. If milk, when fresh, is carefully poured into sterilized flasks, and corked, it may be preserved indefinitely. Repeated warmings have the same effect; but the operation is too delicate to be of practical value. If we touch curdled milk with the point of a pin, and then plunge the point into fresh milk, in a few hours this milk will also be curdled. This pin-point carries the lactic bacilli in sufficient quantities to sow any quantity whatever of the milk-food. By introducing other microbes, milk will undergo a number of dissimilar transformations, according to the germs which are sown in it. The germs of the butyric bacillus condense the milk without its becoming acidulated: on the contrary, it will have an alkaline reaction, with a bitter taste, and an odor resembling that of fresh cheese or whey. By adding a little blue milk, in a few hours the whole becomes blue. The milk neither curdles nor sours, but a drop examined under the microscope is seen to swarm with vibrios. This is the cyanogen bacillus; and when sown in glue, in potato, or in soup, it everywhere multiplies, and makes the substance blue. At times this bacillus causes an eruption, which is cured with much difficulty. Milk is not rendered unwholesome by it, nor disagreeable in taste; but it is blue, which does not increase its market-value. A little ropy milk added will in three days make milk so thick that we can invert a bottle containing it without losing a single drop. In this case a peculiar microbe, a micrococcus, has been at work. This has been described by Mr. Schmidt-Mulheim, who deserves a place of honor among confectioners; for he has discovered a method of producing

<sup>1</sup> Abridged from an article by Dr. H. FOL, in the *Journal de Genève*.

a substance much resembling gum-tragacanth, which, when added to the jelly, makes it harden. This milk-jelly is easily digested, its taste is perfect, and it may be preserved, even in the air, for ten days. The inhabitants of the north of Sweden preserve the precious microbe, caring for it as the savages care for their fire. They put it in all the milk they wish to preserve, as such milk is better and more easily obtained, in every case, than the condensed milk of the factories of Cham and Montreux. Alcoholic fermentation is produced in milk when sown with koumiss, or with the fungus of kéfir, a favorite Russian drink. This curious ferment is a combination of two distinct ferments, — a yeast analogous to that of wine, and a microbe, *Dispora caucasia*. These two organisms live together in perfect harmony, and for a common end, — the production of a gaseous, piquant, agreeable, and, above all, healthful beverage. The kéfir is especially valuable as a food for infants and invalids. Several physicians of Geneva intend to make trials of it, and we are in hope of being soon enriched by the addition of a new and valuable hygienic food.

#### THE MERIDIAN CONFERENCE.<sup>1</sup>

At Tuesday's meeting, Oct. 14, the resolution to reckon longitudes east and west from Greenwich to plus and minus 180° was advocated by Professor Adams, Capt. Evans, and Gen. Strachey, of Great Britain, and by Mr. Rutherford; the very strong point being urged in its favor, that the jump in longitude from + 180° to - 180° occurs in the Pacific Ocean, where the local time now jumps twenty-four hours, — and it must do this somewhere, — and hence it will cause no change from the present practice among navigators, or in the date of the present local time of any part of the earth; and the relation between the local date and hour of any place, and the universal time of the Greenwich meridian, will always be correctly given by the simple formula,  $L.T. = U.T. + \lambda$ ,  $\lambda$  being the longitude expressed as above. After a short recess for informal discussion, the resolution was adopted by a small majority.

A resolution was then introduced, that the conference propose the adoption of a universal day for all purposes for which it may be found convenient, and which shall not interfere with the use of local time where desirable.

The delegate from Italy offered as a substitute the resolution of the geodetic conference at Rome, which proposed a universal day of twenty-four hours, beginning at Greenwich, mean noon; i.e., the present astronomical day, twelve hours later than the civil.

Mr. Allen here read a paper upon the needs and conveniences of the railroads and telegraphs, advocating local times differing whole hours from each other, and introduced a resolution that local time be held to mean that of the nearest meridian situated some whole number of hours from Greenwich; but, after some discussion as to the competence of the conference to go so far into details, he withdrew it.

The resolution to adopt the recommendation of the

Roman conference was lost, and the original resolution was adopted by a large majority.

It was then proposed that the universal day be a mean solar day, to begin for all the world at the moment of midnight of the initial meridian, coinciding with the beginning of the civil day and date of that meridian, and to be counted from zero up to twenty-four hours.

To give time for informally considering this, and for the secretaries to revise and publish in English and French the two-days' proceedings, the conference adjourned till Monday, the 20th.

At the meeting on Monday, the delegate from Spain proposed the adoption of a universal day corresponding to the local day of Rome, 'on account of classic historical associations,' and apparently with the idea that somehow the epoch of the Gregorian calendar would be changed by adopting the Greenwich day.

Professor Adams and Commander Sampson pointed out the confusion that would arise from reckoning time from one meridian, and longitude from another; and, after further discussion, all the amendments were voted down, and the original resolution, recommending a universal day beginning at midnight of the prime meridian, and counted from zero to twenty-four hours, was adopted by a considerable majority. Another resolution was passed by a large majority, expressing the hope of the conference that the astronomical and nautical days may soon be arranged everywhere to begin at midnight.

Mr. Janssen introduced a resolution expressing the hope of the conference that all nations will make a study of the advantages of dividing the day and circular measure, wherever used, into four quadrants, with decimal division of quadrant. After considerable discussion, this was adopted with a slight modification in the phraseology.

Gen. Strachey offered a resolution recommending that all local times differ, by some multiple of ten minutes, from that of the prime meridian. Without acting on this, the conference adjourned till Wednesday.

#### COTTERILL'S APPLIED MECHANICS.

*Applied mechanics: an elementary general introduction to the theory of structures and machines.* By JAMES H. COTTERILL. London, Macmillan, 1884. 20 + 584 p. 8°.

THE appearance of a new book by the distinguished lecturer on applied mechanics at the Royal naval college, the organization of which he has done so much to forward, and the prosperity and success of which are ascribed so largely to Professor Cotterill, is an event likely to interest all who are engaged in similar lines of work. The opportunity is not open to the writer upon the subject of applied mechanics to produce as completely novel a work as was the earlier book by the same author, — 'The steam-engine considered as a heat-engine.'

<sup>1</sup> Continued from p. 378.